REMARKS

Applicants have amended claims 24 and 25. Claims 24-38 and 40-44, of which claim 24 is independent in form, are presented for examination.

The Examiner has rejected claims 24-38 and 40-44 as anticipated by Read et al., "Low Temperature Performance of λ-MnO_2 in Lithium Primary Batteries," *Electrochemical and Solid-State Letters*, Vol. 4, No. 10, pp. A162-165 (2001) ("Read") under 35 U.S.C. § 102(a), and/or as obvious in view of Read under 35 U.S.C. § 103(a).

As amended, claims 24-38 and 40-44 recite a method of manufacturing an electrochemical cell. The method includes <u>selecting a lambda manganese oxide that, when incorporated into a positive electrode of a cell, can provide the cell with a specific discharge capacity at a nominal discharge rate of 1 mA/cm^2 to a 3V cutoff of greater than 130 mAh/g</u>. The method also includes incorporating the lambda manganese oxide into a positive electrode, and forming a cell including the positive electrode and a lithium negative electrode. <u>The cell has</u> a closed circuit voltage of about 4V and <u>a specific discharge capacity at a nominal discharge rate of 1 mA/cm^2 to a 3V cutoff of greater than 130 mAh/g</u>. But claims 24-38 and 40-44 are not anticipated by Read or obvious in view of Read, at least because Read fails to disclose or suggest a method of manufacturing a cell including selecting a lambda manganese oxide that, when incorporated into a positive electrode of a cell, can provide the cell with a specific discharge capacity at a nominal discharge rate of 1 mA/cm^2 to a 3V cutoff of greater than 130 mAh/g. Read also fails to disclose or suggest a cell having a specific discharge capacity at a nominal discharge rate of 1 mA/cm^2 to a 3V cutoff of greater than 130 mAh/g.

Read discloses a cell that includes a lambda-manganese dioxide cathode material formed by acid digestion of a $LiMn_2O_4$ spinel. (<u>See</u> Read, page A162.) Read discharges the cell at a discharge rate of 1.0 mA/cm^2, to a cutoff voltage of 2.0 V. (<u>See</u> <u>id.</u>) The resulting discharge curve (Figure 1 of Read) is reproduced below:

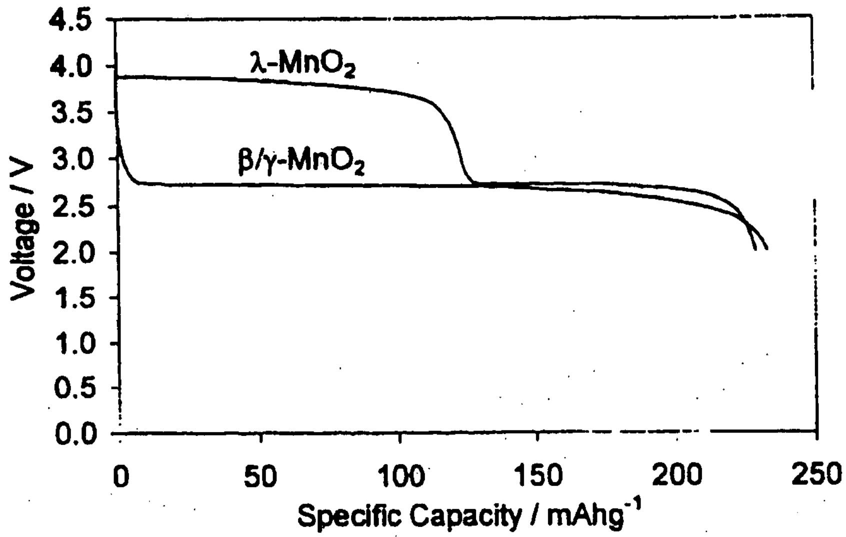


Figure 1. Specific capacity of λ-MnO_2 and β/γ-MnO_2 at 1.0 mA/cm^2 and 20°C.

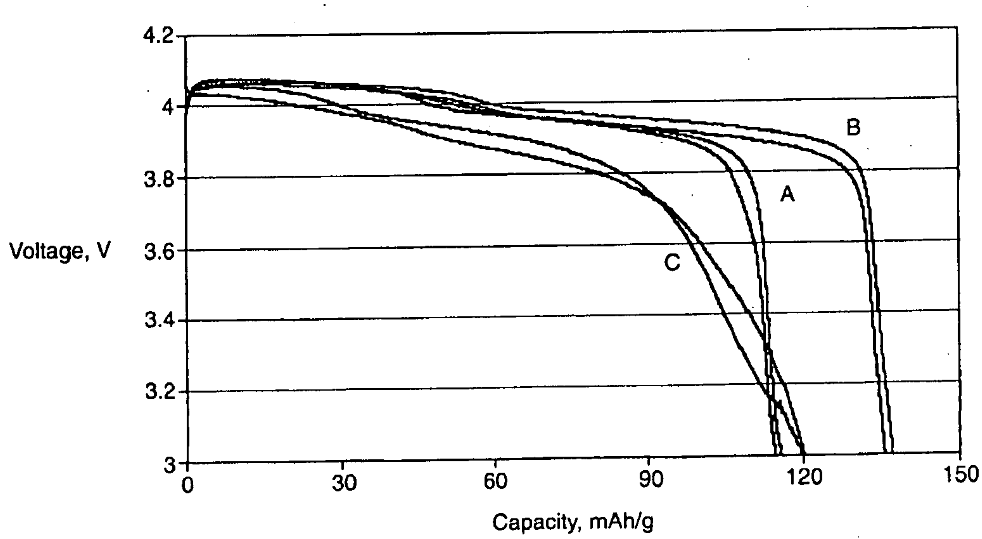
As shown in Figure 1, and as the Examiner has conceded (see September 29, 2005 Office Action, page 3), Read's lambda-manganese dioxide cell does not have a specific discharge capacity at a nominal discharge rate of 1 mA/cm^2 to a 3V cutoff of greater than 130 mAh/g. However, the Examiner has stated that "there is nothing on record to show the differences between the claimed method and the method taught by Read et al.", and that, "[t]here is nothing on the record to explain how the same method steps using the same starting materials can give different properties." (Id. at pages 3-4.)

But Read's method does not use the same starting materials as the example methods disclosed in Applicants' specification. Read's method uses a λ-MnO_2 prepared by acid digestion of L203, a $LiMn_2O_4$ spinel from Chemetals. (See Read, page A162.) Applicants' example methods, on the other hand, use lambda manganese dioxide prepared from "spinel A" ($Li_{1.06}Mn_{1.94}O_4$, from Kerr-McGee, #210), "spinel B" ($Li_{1.01}Mn_{1.99}O_4$, from Carus Chemical Co.), or "spinel C" (LMO-800E, a spinel having a nominally stoichiometric composition, from

Erachem/Chemetals). (See Application, pages 11-13.)[1] As Applicants explain in their specification, the type of spinel that is used to prepare a lambda manganese oxide affects the specific discharge capacity of the cell:

> Typical discharge curves for cells containing the λ-MnO_2 samples prepared from various commercial spinels are shown in Figure 4 [reproduced below]. Lithium cells with composite cathodes containing λ-MnO_2 from spinel C discharged to a 3V cutoff at a nominal rate of about 1.0 mA/cm^2 gave specific capacities of about 120 mAh/g. Under similar discharge conditions, cells with composite cathodes containing λ-MnO_2 prepared from the spinel B gave a substantially greater specific capacity of about 135 mAh/g. . . . . Based on the discharge data for cells shown in Figure 4, the λ-MnO_2 prepared from spinel B clearly provides superior low-rate discharge performance compared to λ-MnO_2 derived from either spinel A or spinel C. (Application, pages 13-14, emphasis added.)

FIG. 4



[1] Applicants note that on page 12, line 31 of the specification, "spinel B" should actually be "spinel C", as is clear from page 13, lines 23-28 of the specification.

Thus, while Read might disclose a method having some similarities to Applicants' example methods, Reid fails to disclose or suggest selecting a lambda manganese oxide that, when incorporated into a positive electrode of a cell, can provide the cell with a specific discharge capacity at a nominal discharge rate of 1 mA/cm^2 to a 3V cutoff of greater than 130 mAh/g. Rather, Reid discloses selecting a lambda manganese dioxide that, when incorporated into a positive electrode of a cell, provides the cell with a specific discharge capacity at a discharge rate of 1 mA/cm^2 to a 3V cutoff of <u>less</u> than 130 mAh/g. Thus, Reid fails to disclose a method that is covered by claims 24-38 and 40-44, and accordingly does not anticipate claims 24-38 and 40-44.

The Examiner also has asserted that a cell having a specific discharge capacity at a nominal discharge rate of 1 mA/cm^2 to a 3V cutoff of greater than 130 mAh/g is obvious in view of Read. More specifically, the Examiner has asserted that although Read discloses a specific discharge capacity of around 120 mAh/g, and does not disclose a specific discharge capacity of 130, 135, or 140 mAh/g or greater,

> [i]t would have been obvious to one having ordinary skill in the art at the time the invention was made to . . . design the cell to have a specific discharge capacity greater than 140 mAh/g since it has been held that where general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. (<u>See</u> September 29, 2005 Office Action, page 5.)

But Read fails to disclose or suggest <u>how</u> to form a cell with a specific discharge capacity at a nominal discharge rate of 1 mA/cm^2 to a 3V cutoff of greater than 130 mAh/g, or that such a cell having such a discharge capacity can even be achieved. For example, Read fails to disclose or suggest selecting a lambda manganese oxide that, when incorporated into a positive electrode of a cell, can provide the cell with a specific discharge capacity at a nominal discharge rate of 1 mA/cm^2 to a 3V cutoff of greater than 130 mAh/g. Thus, Read fails to suggest a method covered by Applicants' claims.

Because Read fails to disclose or suggest a method covered by claims 24-38 and 40-44, these claims are neither anticipated by Read, nor obvious in view of Read. Accordingly, for at

least the reasons discussed above, Applicants believe that claims 24-38 and 40-44 are in condition for allowance, which action is requested.

Enclosed is a check for the Petition for Extension of Time fee. Please apply any charges or credits to deposit account 06-1050.

Respectfully submitted,

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Jeffie A. Kopczynski

Jeffie A. Kopczynski
Reg. No. 56,395

Fish & Richardson P.C.
225 Franklin Street
Boston, MA 02110
Telephone: (617) 542-5070
Facsimile: (617) 542-8906

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